Author's response to reviews

Title: Does the local food environment around schools affect diet? Cross-sectional and longitudinal associations in adolescents attending secondary schools in East London

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Author's response to reviews:

Response to reviewers: please see the revised manuscript, with changes highlighted in grey throughout.

Many thanks for your comments, which led to substantial revisions and what we hope you will see is a vastly improved paper. The paper now reports the results of the longitudinal analysis only. Many of reviewer 2’s comments overlap with reviewer 1, as outlined below.

Reviewer 1, Shannon Zenk:

Major:

We have adjusted the analysis for the paper in line with your suggestions. The focus is now entirely on the longitudinal sample, with all schools included in the study regardless of the number of respondents who attend each one. The regression analysis is clustered by school, and the data have been imputed to provide a total sample of n=757, an increase from the complete case analysis of n=523 in the original paper (see page 8). Multiple imputation was used to create a series of imputed datasets in SPSS 19.0, and the final regression models were carried out on the pooled results from these 15 imputations (page 9). This is a recommended approach, with all variables that were in later models included in the imputation process (Stearne et al 2009).

The results from analysis using the imputed dataset are similar to the original complete case analysis (table 2 provides details of the sample population). More of the tested associations between diet and distance to food outlets are statistically significant in the imputed dataset analysis though the direction and parameter estimates are very similar. Most likely it is the 44% increase in number of cases using the imputed dataset that provides greater statistical power, leading to more identified significant relationships.

Regarding the food environment measures, we were limited to the different phone directories for the two time points as the local council does not maintain
historical records for the environmental health retail food register, which would
have been preferable. In addition, after contacting online directories such as
yell.com, they do not keep records of their listings. As a result the only option for
data from 2001 and 2005 was to source hard copies of the telephone directories
(pages 9-10). We have cited the recent validation study by Lake et al, based here
in the UK, to show the level of agreement between phone directories and the
actual food environment.

The food outlets are grouped into 1) takeaway and 2) grocer/convenience
store/supermarket) because these are the categories available in the telephone
directories. Unfortunately the standardised codes available from environmental
health registers or similar are not available for the data. However, as we mention
in the discussion, the classification of grocers as sources of ‘healthy’ food only is
limiting. In particular, the outlets listed as grocers may have limited floor space
and/or healthy food options, unlike in the US or Australia. It may not be as
appropriate to separate convenience and grocery stores/supermarkets given our
lack of clear data on each store classification and the local food environment
which includes only a few large food stores. We have maintained the takeaways
as sources of less healthy options, in line with recent research in this same
geographic area about the food available. The discussion relating to all of these
points is now extended in the paper (pages 9 -11, 14-15).

The measures of access are based on the distances approximately travelled on
foot within 5 and ten minutes, 400 and 800 metres. These distances are
frequently used in the ‘food desert’ literature to mark out access and have
previously been applied to measure school food environments (Day & Pearce
2010). We included counts of each outlet type within the network buffers around
schools as well (table 3).

We have updated the discussion around the geocoding to clarify the relative size
of a postcode and explain the geocoding process. To assess the accuracy of the
food environment datasets which were entered into an Excel spreadsheet
manually, a random sample of 10% from each year was checked by a second
researcher. This was done by searching for the address online using the Google
search engine to ensure the postcode on the dataset was correct; the telephone
directories provide only the street address and the first part of the postcode (eg,
E1) rather than the full postcode of E1 4 NS which would provide us with a nearly
exact location.

The development of the diet measure and validation is reported in a paper
currently being revised for publication. This is now clear in our paper, and the
uncertainty of some parts of the diet score is discussed on page 17. In one study
of Tower Hamlets, students report stopping on the way to school to buy cereal
bars, sausage rolls for breakfast so there is evidence that the local food
environment may influence this meal.

As mentioned before, the model is now clustered by school.

We have now removed the bivariate and cross-sectional analysis from the paper.
The discussion is now extended to consider the directions of the relationships.
Because of the aspects of diet we were considering, and the age group of
respondents, it is unlikely they will be purchasing fruit and veg to take home and prepare for a meal. Instead, they are likely to use any food store as a means of buying a snack or prepared food for breakfast or lunch. This is reflected in our focus on the locations near to school rather than home. We agree that not having information on home food environment is a confounder, just as the lack of school/work food environment is a limitation/confounder in residential food environment studies.

Minor:

Thank you for the additional reference on longitudinal food environment and diet. We have updated the literature for this topic area (pages 6-7).

The background is revised in light of these comments.

All measures are now in the methods section.

There is greater discussion of the results to provide a more thorough overview of the results and how they may be interpreted in the discussion section.

Reviewer 2, Lukar Thornton:

Major:

We have refocused the background section to school food environments and the importance of longitudinal studies, with less emphasis on deprivation. There are now several new paragraphs (pages 4-6) which focus on school food environments, and answer your comments regarding student food purchasing/bringing food from home in the UK. We have drawn on smaller surveys reported in the grey literature to justify our focus on the area near to schools, and the consideration of local outlets.

The proximity measures for food access are commonly used in areas where walking is a common means of transport (refs) and has been used previously for school food environments. The table which presents the food environment data now includes a range for each store type – year – distance combination. Only two schools had the nearest outlet located beyond 400m.

The cross-sectional analysis is now removed from the paper to give more attention to the longitudinal analysis, as mentioned above.

Minor: all minor comments are address with thanks.